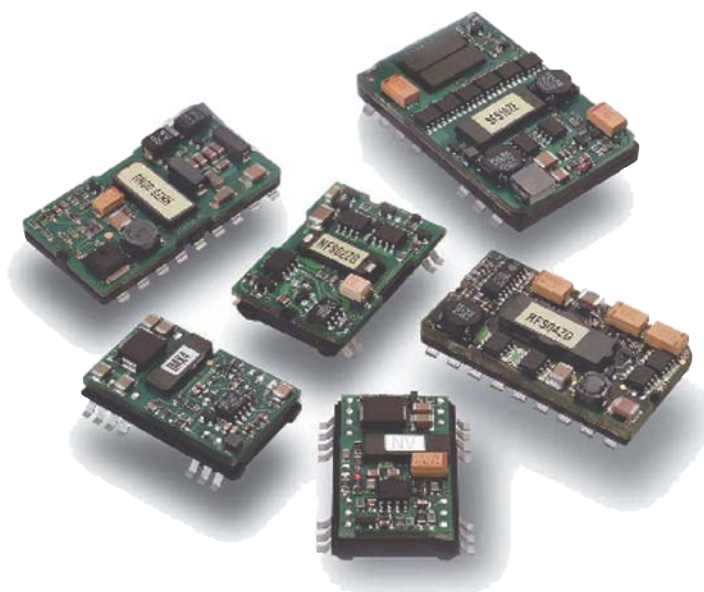




## **An Innovative New Series of Surface Mount DC/DC Converters**

### **Overview**

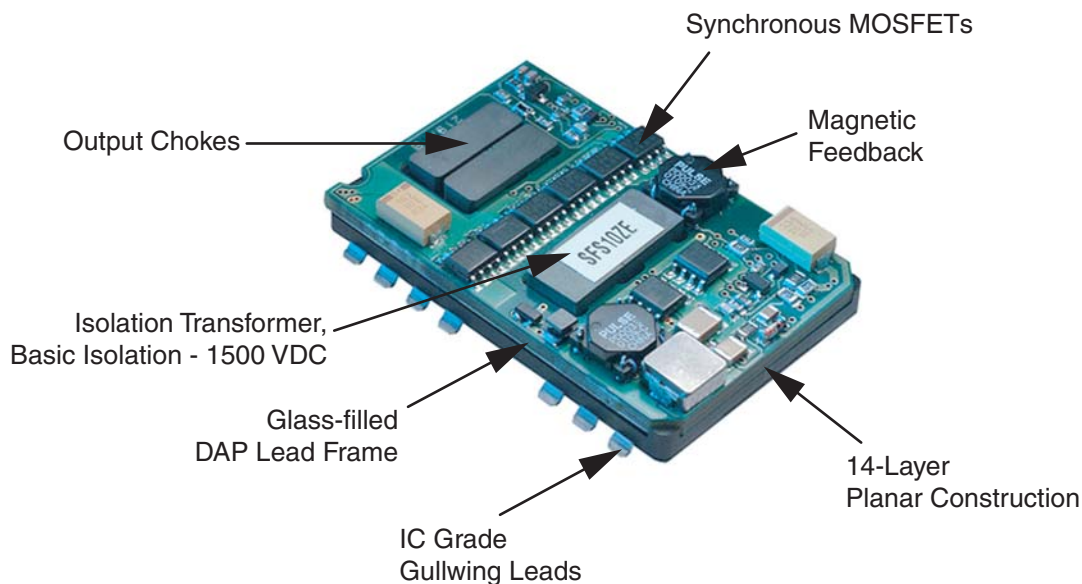
The One-SMarT™ family of surface mountable DC/DC converters provide isolated low voltage outputs from 1.5 to 24VDC. These Distributed Power Architecture (DPA) compatible products are available in a comprehensive range of ultra-low profile form factors, most under 8.5mm. High efficiencies and current densities are achieved through sophisticated design techniques such as integrated single-substrate planar transformers. These techniques also increase reliability through uniform heat dissipation. Additional benefits of this advanced thermal management include 60°C operation at full-rated power with no airflow for selected models. Automated manufacturing processes facilitate high quality, including exceptional lead co-planarity. JEDEC trays are utilized for high-volume SMT lines with vacuum pick-up capabilities.

### **Features**

- ▶ Comprehensive selection of power ranges and packages.
- ▶ Compatible with high volume SMT processes.
- ▶ Excellent low-load regulation, stability, and EMC performance.
- ▶ Ultra-low profiles, most under 8.5mm.
- ▶ High efficiencies and current densities.
- ▶ Wide input ranges on selected models.
- ▶ Exceptional lead co-planarity.

Please consult the Power-One web-based product selector for other surface-mount product families.

### Advanced Designs Provide Ultra-High Current Densities



This innovative product family uses open-board construction, with a single substrate planar transformer as the motherboard onto which all other components are mounted in a completely automated, 'hands-off' manufacturing process. This process is streamlined with patented in-line testing and robotized handling to assure very high quality and precise control of lead-out co-planarity. The open-board format eliminates the need for expensive transfer molding, enabling rapid introduction of manufacturing to any of Power-One's high volume SMT plants globally. The products are supplied in JEDEC trays and are suitable for use in high volume SMT lines with vacuum pick-up capabilities.

### Ideal Components for Distributed Power Architectures

The combination of advanced topologies and comprehensive product breadth make One-SMaRT™ products ideal components for Distributed Power Architectures (DPAs). Power-One also supports DPA applications with through-hole DC/DC converters and a broad line of AC/DC power supplies including DPA front ends.

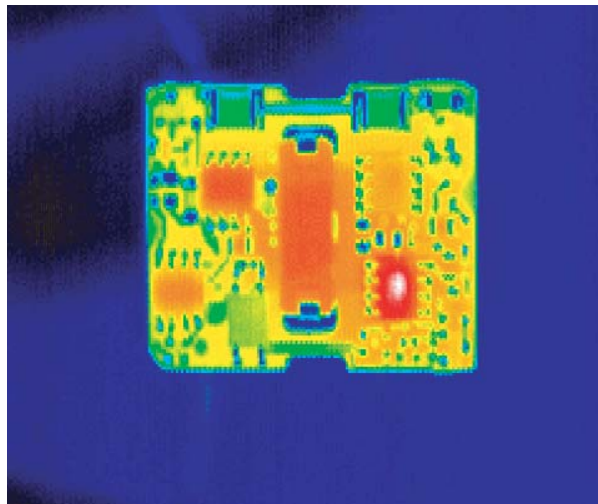
### Typical Thermal Profile of a One-SMaRT™ Converter

Industry-leading power densities are the result of high efficiencies and sophisticated thermal management techniques. Typical One-SMaRT™ construction includes integration of planar transformer windings into a multiple-layer PWB to provide additional thermal mass for uniform heat dissipation. This advanced design also facilitates low component temperature rises above ambient, for increased reliability.

#### Temperature Rise

|            |      |
|------------|------|
| White:     | 51°C |
| Red:       | 49°C |
| Orange:    | 47°C |
| Yellow:    | 41°C |
| Green:     | 35°C |
| Sky Blue:  | 32°C |
| Navy Blue: | 29°C |
| Black:     | 21°C |

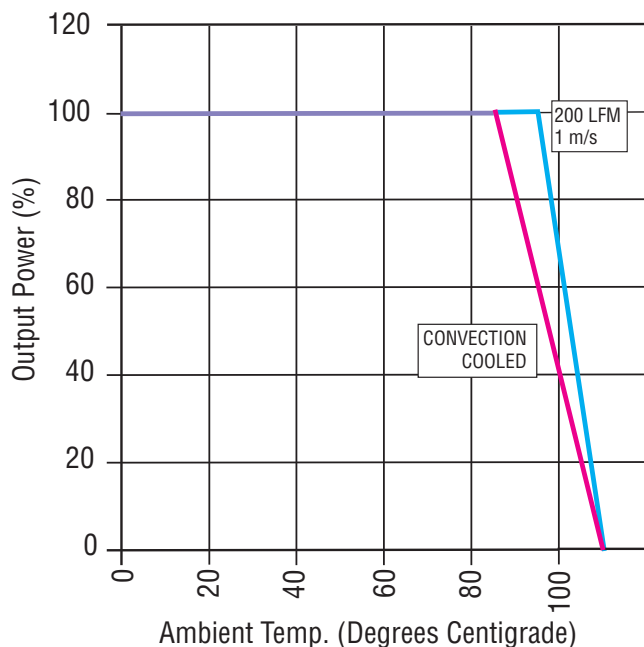
Ambient Trise 30°C



NDS Series Temperature Profile with 200 LFM Cooling  
Vin = 48V, Iout = 3A

### Selected Models Fully Rated to 85°C with No Airflow

#### Output Power Vs. Ambient Temp. and Airflow



One-SMaRT™ products are designed to provide high currents in elevated ambient temperature environments with minimal cooling. This graph depicts the thermal derating characteristics of 9-36V and 18-75V input NV Series products. In addition other NV models feature a 4:1 input voltage range and provide full power operation at 85°C ambient temperature using only convection cooling. Please consult data sheets for thermal characteristic curves for other One-SMaRT products.

## Isolated Single & Dual Output Products Under 50 Watts

### NV

- 4 to 6 Watts
- Single/Dual Outputs
- 1500 VDC Isolation
- Operation from -40 to 85°C
- Wide Input Range



1.30 x 0.81 x 0.33 inch  
33.0 x 20.6 x 8.5 mm

### NDS

- 4 to 10 Watts
- Single Outputs, 1.5 to 5 VDC
- 1500 VDC Isolation
- Remote On/Off
- Output Voltage Trim



1.30 x 0.91 x 0.33 inch  
33.0 x 23.0 x 8.5 mm

### RNS/RND

- 5 to 10 Watts
- Single/Dual Outputs
- 1500 VDC Isolation
- Operation to 85°C
- Wide Input Range



1.87 x 1.00 x 0.37 inch  
47.4 x 25.4 x 9.5 mm

### RDS

- 10 to 20 Watts
- 1500 VDC Isolation
- Operation to 85°C
- Very High Performance
- Inhibit Option Available



1.87 x 1.00 x 0.33 inch  
47.4 x 25.4 x 8.4 mm

### RFS

- 9 to 20 Watts
- Single Outputs, 1.5 to 5 VDC
- 1500 VDC Isolation
- Remote On/Off
- Output Voltage Trim



1.87 x 1.00 x 0.37 inch  
47.4 x 25.4 x 9.5 mm

### SFS

- 20 to 43 Watts
- Single Outputs, 1.5 to 5 VDC
- 1500 VDC Isolation
- Remote On/Off
- Output Voltage Trim



2.00 x 1.28 x 0.32 inch  
50.8 x 32.5 x 8.2 mm

Full product data sheets are available on:

[www.power-one.com](http://www.power-one.com)

### Single Output Models

| Output Voltage | Output Current (Amps) | Input Voltage | Power (Watts) | Model         |
|----------------|-----------------------|---------------|---------------|---------------|
| 1.5            | 3                     | 36 to 75      | 4.5           | NDS03ZA-M6    |
| 1.5            | 6                     | 36 to 75      | 9             | RFS06ZA-M6    |
| 1.5            | 13                    | 36 to 72      | 19.5          | SFS13ZA-M6 ★  |
| 1.8            | 3                     | 36 to 75      | 5.4           | NDS03ZB-M6    |
| 1.8            | 6                     | 36 to 75      | 10.8          | RDS06ZB-M6    |
| 1.8            | 6                     | 36 to 75      | 10.8          | RFS06ZB-M6 ★  |
| 1.8            | 13                    | 36 to 72      | 23.4          | SFS13ZB-M6 ★  |
| 2.5            | 3                     | 36 to 75      | 7.5           | NDS03ZD-M6    |
| 2.5            | 6                     | 36 to 75      | 15            | RFS06ZD-M6 ★  |
| 2.5            | 13                    | 36 to 72      | 32.5          | SFS13ZD-M6 ★  |
| 3.3            | 0.9                   | 9 to 36       | 3             | NVS0.9CE-M6   |
| 3.3            | 0.9                   | 18 to 75      | 3             | NVS0.9EE-M6   |
| 3.3            | 1.5                   | 18 to 72      | 5             | RNS01EE-M6    |
| 3.3            | 3                     | 36 to 75      | 10            | NDS03ZE-M6 ★  |
| 3.3            | 3                     | 38 to 75      | 10            | RNS03ZE-M6 ★  |
| 3.3            | 5                     | 36 to 75      | 16.5          | RDS05ZE-M6    |
| 3.3            | 6                     | 36 to 75      | 20            | RFS06ZE-M6 ★  |
| 3.3            | 13                    | 36 to 72      | 43            | SFS13ZE-M6 ★  |
| 5              | 0.7                   | 9 to 36       | 3.5           | NVS0.7CG-M6   |
| 5              | 0.7                   | 18 to 75      | 3.5           | NVS0.7EG-M6   |
| 5              | 1                     | 18 to 36      | 5             | NVS01YG-M6    |
| 5              | 1                     | 36 to 75      | 5             | NVS01ZG-M6    |
| 5              | 2                     | 36 to 75      | 10            | NDS02ZG-M6 ★  |
| 5              | 4                     | 36 to 75      | 20            | RDS04ZG-M6    |
| 5              | 4                     | 36 to 75      | 20            | RFS04ZG-M6 ★  |
| 5              | 8                     | 36 to 72      | 40            | SFS08ZG-M6 ★  |
| 5.05           | 1.2                   | 18 to 72      | 6             | RNS01EG-M6    |
| 5.05           | 2                     | 38 to 75      | 10            | RNS02ZG-M6 ★  |
| 7              | 0.86                  | 18 to 72      | 6             | RNS0.9ET-M6   |
| 12             | 0.34                  | 9 to 36       | 4             | NVS0.3CH-M6   |
| 12             | 0.34                  | 18 to 75      | 4             | NVS0.3EH-M6   |
| 12             | 0.5                   | 18 to 36      | 6             | NVS0.5YH-M6   |
| 12             | 0.5                   | 36 to 75      | 6             | NVS0.5ZH-M6   |
| 12             | 0.6                   | 38 to 75      | 7.2           | RNS0.6ZH-M6 ★ |
| 15             | 0.28                  | 9 to 36       | 4.2           | NVS0.3CJ-M6   |
| 15             | 0.28                  | 18 to 75      | 4.2           | NVS0.3EJ-M6   |
| 15             | 0.4                   | 18 to 36      | 6             | NVS0.4YJ-M6   |
| 15             | 0.4                   | 36 to 75      | 6             | NVS0.4ZJ-M6   |

Unsigned output voltages are isolated and can be used as either + or - polarities.

#### ★ QUICK EVALUATION DELIVERY (QED) PRODUCTS

These latest technology products are readily available at Power-One, or your local distributor, to quickly get power to your prototype system. In addition to fast delivery, Power-One's QED solutions provide industry-leading current and power densities.

### Dual Output Models

| Output Voltage                                | Output Current (Amps) | Input Voltage | Power (Watts) | Model          |
|-----------------------------------------------|-----------------------|---------------|---------------|----------------|
| <b>Dual Output Models, 5-5.2V and 3.3Vout</b> |                       |               |               |                |
| 5.2, 3.3                                      | 1, 1                  | 38 to 75      | 8.3           | RND02ZGE-M6 ★  |
| <b>Dual Output Models, 5V Both Outputs</b>    |                       |               |               |                |
| +5, -5                                        | 0.35, 0.35            | 9 to 36       | 3.5           | NVD0.7CGG-M6   |
| +5, -5                                        | 0.35, 0.35            | 18 to 75      | 3.5           | NVD0.7EGG-M6   |
| +5, -5                                        | 0.5, 0.5              | 18 to 36      | 5             | NVD01YGG-M6    |
| +5, -5                                        | 0.5, 0.5              | 36 to 75      | 5             | NVD01ZGG-M6    |
| +5, -5                                        | 1, 1                  | 38 to 75      | 10            | RND02ZGG-M6    |
| <b>Dual Output Models, 12V Both Outputs</b>   |                       |               |               |                |
| +12, -12                                      | 0.17, 0.17            | 9 to 36       | 4             | NVD0.3CHH-M6   |
| +12, -12                                      | 0.17, 0.17            | 18 to 75      | 4             | NVD0.3EHH-M6   |
| +12, -12                                      | 0.25, 0.25            | 18 to 36      | 6             | NVD0.5YHH-M6   |
| +12, -12                                      | 0.25, 0.25            | 36 to 75      | 6             | NVD0.5ZHH-M6   |
| +12, -12                                      | 0.42, 0.42            | 36 to 75      | 10            | RND0.8ZHH-M6 ★ |
| <b>Dual Output Models, 15V Both Outputs</b>   |                       |               |               |                |
| +15, -15                                      | 0.14, 0.14            | 9 to 36       | 4             | NVD0.3CJJ-M6   |
| +15, -15                                      | 0.14, 0.14            | 18 to 75      | 4             | NVD0.3EJJ-M6   |
| +15, -15                                      | 0.2, 0.2              | 18 to 36      | 6             | NVD0.4YJJ-M6   |
| +15, -15                                      | 0.2, 0.2              | 36 to 75      | 6             | NVD0.4ZJJ-M6   |
| <b>Dual Output Models, 24V Both Outputs</b>   |                       |               |               |                |
| +24, -24                                      | 0.08, 0.08            | 9 to 36       | 4             | NVD0.2CKK-M6   |
| +24, -24                                      | 0.08, 0.08            | 18 to 75      | 4             | NVD0.2EKK-M6   |

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